

# Cost Efficiency and Profit Efficiency Analysis and Its Effect on Profitability in Islamic Banks in Indonesia

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## Abstract:

With a market share below 6%, Islamic banking faces considerable challenges to maintain the existence of its business. Islamic banks show an increase in assets of 856% in the 2008-2017 period, but this amount is still very small compared to conventional commercial bank assets. This study aims to examine Islamic banks' profit efficiency and cost efficiency and assess their influence in the 2011-2017 period on the profitability rate of 11 Islamic banks in Indonesia. Efficiency research is carried out through 2 stages. The first step is to get the level of efficiency of Islamic banking with the Stochastic Frontier Analysis (SFA) method that re-expresses input, output and environmental variables. The second stage is measuring the effect of profit efficiency and cost efficiency variables on the Islamic bank ROA profitability ratio variable. From the results of the study, Bank Panin Syariah was at the highest position and Bank Maybank Syariah was at the lowest position in profit efficiency, while Bank Mega Syariah was in the highest position and Bank Jabar Banten Syariah was in the lowest position in cost efficiency. This research also confirmed that Profit efficiency and cost efficiency have no significant effect on the level of profitability of Islamic banks.

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## 1. Introduction

With a market share below 6%, Islamic banking in Indonesia faces considerable challenges to maintain the existence of its business. Especially in terms of funds, where the method of profit & loss sharing results received by customers for deposits in Islamic banks will look fluctuating when compared with deposit interest in conventional banks (AlFarisi & Hendrawan, 2010). This revenue sharing system also allows customers to monitor Islamic banks' performance directly by tracking the amount of profit sharing that has been achieved. The greater the amount of bank profits, the greater the profit share received by the customer, and vice versa. The amount of profit sharing that is small or shrinking for a long time is an indicator that bank management has declined. This situation

is a transparent and easy early warning for customers. Unlike conventional banking, customers cannot assess performance only from the interest indicators obtained.

Although the development of Islamic banking as an intermediary institution in Indonesia in the last ten years has become increasingly rapid and has begun to be taken into account, it turns out that Islamic banking still has not been able to play a large role in the national banking industry that adheres to a dual banking system. The contribution or share of sharia banking to the national banking sector of 5.44% at the end of 2017 has not been relatively calculated as an institution that can affect macroeconomic indicators. Based on OJK data, Islamic banks and sharia business units showed an increase in assets of 856% in the period 2008-2017 (several sharia spin-off

business units became sharia commercial banks), but the amount was still very small compared to conventional commercial bank assets. This limited asset condition is an important factor that influences the low expansion of Islamic banking business.

Measurement of the banking industry's efficiency with different methods has been performed. In 21 countries, Berger and Humphrey (1997) studied 130 border efficiency studies. During the period 2002-2008, Alfarisi and Hendrawan (2012) examined the effect of capital structure on the output of traditional banks and Islamic banks using the profit-efficiency approach of the Distribution Free Approach. The results show that bank capital ratios have a negative influence on profit efficiency. Alhassan, et al (2015) examined the effect of market power, relative market power, and efficiency on the profitability of banks in Ghana during the period 2003 - 2011 using DEA in measuring efficiency levels. The result shows that technological efficiency influences profitability positively, but scale efficiency has a negative influence on profitability.

On the basis of the mentioned context, the author aims to analyze the level of cost efficiency and profit efficiency in Islamic commercial banks in Indonesia and to analyze the effect on the profitability of Islamic banks in Indonesia, utilizing performance data for the period 2011-2017.

## 2. Literature Review

In general, the efficiency analysis of a service or product refers to a comparison between several outputs and some inputs in the process of making a service or product. Efficiency is measured in order to maximize output, minimize inputs, or maximize profits. (Mokhtar et al, 2006). Farrel (1957) argues that the efficiency of a company consists of two components: technical efficiency TE (technical efficiency) which shows the company's ability to achieve maximum output from the inputs already given., and allocative efficiency that shows the ability of companies to use input - output at optimal proportions,

according to the price and production technology that has been given.

Berger and Mester (1997) there are 3 concepts of economic efficiency that are the most important, namely cost efficiency, standard profit efficiency (standard profit efficiency), and alternative profit efficiency (alternative profit efficiency). The three ideas are considered to be the best economic foundation for examining financial institutions like banks, because they are based on economic optimization as a reaction to market prices and competition, compared to using technology only.

Cost efficiency measures how close a bank costs for producing the same output under the same conditions to the most effective bank costs (border). Efficiency of standard earnings measures how close a bank is to producing maximum profits that can be achieved by using input prices, output prices, and other variables at a certain level. While alternative profit efficiency measures how close a bank is in obtaining maximum profit using one that uses output levels, not using output prices. According to Berger and Humprey (1997) earnings efficiency better describes overall bank performance, because it focuses more on increasing the difference in income compared to focusing on the difference in costs. If there are additional costs to increase greater income, it will be measured that the bank is more profit-efficient but will be measured to be less cost-efficient.

During the period 2002-2008, Alfarisi and Hendrawan (2012) tested through 2 stages the effect of capital structure on the performance of conventional banks and Islamic banks. In the first stage, measurement of profit efficiency values using the Distribution Free Approach (DFA) and in the second stage uses the capital ratio to measure the impact on earnings performance. Of the 102 conventional banks and 3 Islamic banks studied, Standard Chartered Bank has a high rate of efficiency (77%) while the Sulawesi Bank has the lowest efficiency rate (53%).

Perera and Skully (2012) conducted a test of the efficiency measures of parametric stochastic frontier approach (SFA) and non-parametric

Data Envelopment Analysis (DEA). The test results showed that variations in the efficiency of parametric approaches were smaller than non-parametric, and indicated that parametric use was generally consistent with standard performance measurement.

Alhassan (2015) estimates the measurement of profit and cost efficiency at 26 banks in Ghana during the period 2003 - 2011 using SFA. The study results show a high cost-effectiveness compared to profit. The findings of the research based on the size of the bank indicate that big banks have higher costs and profit performance compared to small banks.

Suharyadi and Sumarto (2017) used the parametric DFA approach to calculate the efficiency of the banking industry in Indonesia. Measured efficiency is cost efficiency, standard efficiency of profit and alternative efficiency of profit. The variables chosen use the intermediation approach, using conventional bank annual report data during the period 2004-2015. The study results indicate that the Indonesian banking industry has on average a higher level of profit efficiency and alternate profit efficiency than cost efficiency. BUMN banks have the highest cost effectiveness, while foreign banks choose profit efficiency and the highest possible alternative profit efficiency.

### 3. Methodology

The sample of this research is Sharia Commercial Banks in Indonesia, with a total

of 11 Sharia Commercial Banks. The source of data in this study is secondary data, in the form of Quarterly Bank Publication Financial Reports, with the reporting period March 2011 to December 2017, In this study the efficiency measurement used in this study is to use an analysis where economic efficiency consists of cost efficiency, and alternative profit (alternative profit) is believed to be the best efficiency measurement for financial institutions (Berger and Mester, 1997).

Alternative profit equations can be written in the form of natural logarithms as follows:

$$\ln(\pi) = f_{\pi}(w, y, v) + \ln u_{\pi} + \ln \varepsilon_{\pi} \dots (1)$$

The input variables (y) consisted of:

w1 = Price of Funds = total interest expenses / total funds

w2 = Price of Labor = personal expense / total assets

w3 = Price of Physical Capital = depreciation / fixed assets

The output variables (y) involve:

y1 = Total loans = gross loans

y2 = Net non-interest income = Other Earning Assets

y3 = Securities

While the environment variable represents an uncontrolled variable that still can affect the company's earnings. This research utilized the inflation as environment variable. The environment variables (y) include:

v = Inflation in 2008 – 2017

Alternative profit efficiency is the ratio of the predicted actual profit to the best predicted maximum profit from the bank, which can be written as follows:

$$APEFF^i = \frac{a\hat{\pi}^i}{a\hat{\pi}^{max}} = \frac{\{\exp[\hat{f}_{a\pi}(w^i, y^i, v^i)] \times \exp[\ln \hat{u}_{a\pi}^i]\} - \theta}{\{\exp[\hat{f}_{a\pi}^i(w^i, y^i, v^i)] \times \exp[\ln \hat{u}_{a\pi}^{max}]\} - \theta} \dots (2)$$

Cost efficiency is the minimum cost prediction ratio needed by the best bank to generate the output of the bank against the bank's actual cost prediction, which can be described as follows:

$$CEFF^b = \frac{C^{min}}{C^b} = \frac{\{\exp[\hat{f}_b(w^b, y^b, v^b)] \times \exp[\ln \hat{u}_c^{min}]\}}{\{\exp[\hat{f}_{a\pi}^i(w^i, y^i, v^i)] \times \exp[\ln \hat{u}_c^b]\}} = \frac{\hat{u}_c^{min}}{\hat{u}_c^b} \dots (3)$$

#### 4. Results

Tabel 1. Sharia Bank's Efficiency Level in Indonesia

Ranking	Bank	Cost Efficiency Estimation
1	Bank Mega Syariah	0.97705
2	Bank BNI Syariah	0.95955
3	Bank Maybank Syariah	0.95593
4	Bank Victoria Syariah	0.88857
5	Bank Panin Syariah	0.87227
6	Bank Syariah Mandiri	0.86491
7	Bank Muammalat Indonesia	0.84197
8	Bank Bukopin Syariah	0.83481
9	Bank BRI Syariah	0.81712
10	Bank BCA Syariah	0.80156
11	Bank Jabar Banten Syariah	0.71599
	<b>Average</b>	0.86634

From table 1 above shows that the score of the level of efficiency of Islamic banking in Indonesia in the period of 7 years (2011 - 2017) found that Mega Syariah Bank is the most efficient bank with an efficiency score of 0.97705. Followed in the second and third place by Bank BNI Syariah with an efficiency score of 0.95955 and a Sharia Maybank Bank with an efficiency score of 0.95593. Whereas

the most inefficient Islamic banks are occupied by Bank BRI Syariah (0.81712), BCA Syariah Bank (0.80156), and Bank Jabar Banten Syariah (0.71599). Overall, the average level of efficiency of Islamic banking in the period 2011-2017 is 0.86634. This means that there is still room to increase the efficiency level by 0.11071

Table 2. Test of Input and Output Variables to Cost Efficiency Level

	coefficient	standard-error	t-ratio	var	Remarks	Significant
beta 0	-2.1895	0.3282	-6.6704			
beta 1	31.7949	1.9769	16.0835	W1	Price of Funds	*
beta 2	8.8760	0.7207	12.3162	W2	Price of Labor	*
beta 3	0.0416	0.0042	9.8896	W3	Price of Physical Capital	*
beta 4	0.6809	0.0251	27.1250	Y1	Total loans	*
beta 5	0.0640	0.0099	6.4547	Y2	Other earning asset	*
beta 6	0.1741	0.0174	10.0213	Y3	Securities	*
beta 7	-0.1056	0.7520	-0.1405	Z1	Inflation	-

Remarks :

\* Significant at  $\alpha = 1\%$

\*\* Significant at  $\alpha = 5\%$

\*\*\* Significant at  $\alpha = 10\%$

Findings from this study in table 2 above indicate that variable fund prices labor costs,

physical asset prices, total loans, other earnings assets and securities have a positive

and significant impact on cost efficiency levels. This means the higher fund ratio prices labor prices, physical asset prices, total loans,

other earnings assets and securities would raise Islamic bank costs.

Table 3. Test of Input and Output Variables to Profit Efficiency Level

	coefficient	standard-error	t-ratio	var	remarks	significant
beta 0	-7.7966	6.4540	-1.2080			
beta 1	161.4214	44.6127	3.6183	W1	Price of Funds	*
beta 2	-109.4142	14.4039	-7.5961	W2	Price of Labor	*
beta 3	-0.8604	0.1001	-8.5920	W3	Price of Physical Capital	*
beta 4	-0.7966	0.5458	-1.4596	Y1	Total loans	-
beta 5	-0.8907	0.2143	-4.1561	Y2	Other earning asset	*
beta 6	1.4228	0.3585	3.9686	Y3	Securities	*
beta 7	1.7066	2.9221	0.5840	Z1	Inflation	-

Remarks :

\* Significant at  $\alpha = 1\%$

\*\* Significant at  $\alpha = 5\%$

\*\*\* Significant at  $\alpha = 10\%$

Finding from this research on table 3 above show that The price of fund variable has a positive and significant effect on the level of profit efficiency. Meanwhile, price of labor, price of physical assets, total loans, other earnings assets and securities have a negatif and significant effect on the level of profit efficiency. This means that the higher price of labor, price of physical assets, total loans, other earnings assets and securities will increase the profit of islamic bank.

## 5. Conclusion and Implications

The following conclusions can be drawn on the basis of the research carried out on the study of cost efficiency and profit efficiency in Islamic banks in Indonesia and their effect on the profitability of Islamic banks in Indonesia during the period 2011-2017:

1. Using the Stochastic Frontier Analysis method to measure cost efficiency shows Mega Syariah Bank as the bank with the highest level of cost efficiency with 0.97705 (97.71%) and Bank Jabar Banten Syariah as the bank with the lowest cost efficiency

level at 0.71599 (71.60% ) Overall, the average level of cost efficiency of Islamic banks in Indonesia is 0.86634 (86.63%). This means that there is room to increase sharia banking efficiency in Indonesia by 0.11071

2. The price of fund variable, price of labor, price of physical assets, total loans, other earnings assets and securities have a positive and significant effect on the level of cost efficiency. This means that the higher price of fund ratio, price of labor, price of physical assets, total loans, other earnings assets and securities will increase the cost of islamic bank.
3. The price of fund variable has a positive and significant effect on the level of profit efficiency. Meanwhile, price of labor, price of physical assets, total loans, other earnings assets and securities have a negatif and significant effect on the level of profit efficiency. This means that the higher price of labor, price of physical assets, total loans, other earnings assets and

securities will increase the profit of Islamic bank.

4. Need to measure the effect of efficiency on other profitability ratios, such as ROE and NIM . This is to add to the perspective of profitability in terms of capital ownership and operational effectiveness.
5. The need for a comparison between the efficiency of Islamic banks and conventional banks in Indonesia, or the comparison between the efficiency of Islamic banks in Indonesia and Islamic banks in Southeast Asian countries with a majority Muslim population. This is to spur Islamic banks in Indonesia to improve competitiveness in terms of efficiency as well as the development of the Islamic finance business globally.

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